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ABSTRACT

The purpose of this pilot study was to investigate the relationship between achievement, teacher-reported letter grades, and instructional levels in a sample of 100 Chapter 1 students who had participated in the program for two years. For each student, third grade and fifth grade California Achievement Test scores, end-of-year letter grades, and instructional book level were analyzed. The results of a multiple regression analysis indicated that 72 percent of the variance in fifth grade reading achievement and 58 percent of the variance in fifth grade math achievement could be explained by third grade achievement, instructional levels at third and fifth grade, letter grades at third and fifth grade, and school. The principal components extracted in an exploratory factor analysis were third grade instructional level, fifth grade instructional level and third grade achievement for reading; and third grade and fifth grade instructional level for math. The results suggest that instructional placement levels over time, in addition to analysis of standardized achievement gains in math and reading, might provide more realistic estimates of program inpact. (BW)

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THE RELATIONSHIP BETWEEN INSTRUCTION, GRADES, AND ACHIEVEMENT OF CHAPTER I STUDENTS

by

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The research on the long-term impact of Chapter I (formerly Title I) programs has generally not provided conclusive evidence regarding program effectiveness. One study found that students who exited from Title I programs after one year had higher achievement scores as a group than students who remained in the Title I program for two years (DeVito & Ruberstein, 1979). Another study concluded that participation in compensatory education had negative effects on the achievement of students initally designated as needing compensatory education in the first year of participation. In the second and third years the effects on achievement were found to be negative but nonsignificant (Wingard Smith & Wang, 1981).

Conversely, some studies have reported that achievement gains for Title I students were generally sustained as long as three years (Greene & Farstrap, 1981). Another study suggested that compensatory programs had an impact nine years later on student grades, SAT scores and social adjustment (Sprigle, Breivogel, Reed & Resnick,1981).

One of the conclusions from the sustaining effects study indicated that although Title I students received instructional services that are in addition to, and different

from, the instructional services of regular students, these services may not add up to a net positive effect. Regular students frequently receive instruction in a different subject or setting that the Title I student does not receive. And the regular student is more frequently receiving instruction from a regular teacher with more teaching experience than special personnel instructing Title I students (Carter, 1980).

Methodological and conceptual differences in many of these studies make comparisons and generalizations difficult. For example, there is no general agreement concerning what is meant by a "sustained gain". (Perry, 1983). There is agreement, however, that program impact can be measured by gains in standardized achievement test scores. These scores allow comparison to other samples and a national reference group and are required as part of the evaluation models mandated by the federal government. There are other measures generally available at the local level such as instructional placement and teacher-reported letter grades which may be useful for measuring changes in student learning and assessing program impact. Few studies have included these variables in the investigation of program impact.

One might expect that over time, in addition to exhibiting growth on standardized achievement tests, students who participate in Chapter I might also show commeasurate growth in instructional placement levels. Instructional placement, however might also influence students' achievement level. One might also expect that teachers' judgments as expressed by letter grades would be reflective of both students' achievement and instructional levels. Students' letter grade obtained in a prior year might have a direct effect on achievement in a subsequent year or an indirect effect through instructional level. Hypothesized relationships between the variables included in this study are shown in Figure 1.

(Insert Figure 1 about here)

The purpose of this pilot study was to investigate the relationship between achievement, teacher-reported letter grades and instructional levels in a sample of Chapter I students who had participated in the program for a two year period.

1. Methodology

1.1. Sample

The sample consisted of 100 sixth grade students selected from two elementary schools located in a district in the northeast. Both schools had a Chapter I program in accordance with the low income criteria mandated by the former Elementary- Secondary Act of 1963 and ECIA of 1981. Chapter I students included in this study had participated in a Chapter I reading and math program for two years. Chapter I instruction at both sites consisted of 45 minutes a day in reading and math, respectively in a laboratory setting. The two-year treatment period occurred between third and fifth grade and was not necessarily two consecutive years of participation.[1] The fifty non Chapter I students were selected randomly from the same two schools. The race and

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[1] The author is aware that one of the methodological problems of analyzing data for intact groups, such as Chapter I students is that such students are not randomly selected to participate in the program and that there is a selection bias. This problem is magnified by including students who have participated in Chapter I programs for a second year since these students are those who continue to achieve at the lowest levels. One solution, beyond the scope of this study, is to use an econometric technique which analyzes selective samples by including a model of the selection process in the analysis and then statistically controlling for this source of bias. For a discussion of this method, see Muthen & Joreskog, (1983).

sex of students in the two samples are shown in Table 1.

(Insert Table 1 about here)

1.2. Variables Included in Analysis

For each student in the sample, third and fifth-grade reading and math normal curve equivalents and scale scores from the California Achievement Tests, From D, 1977 version were obtained.[2] These tests are administered each spring and reflect end- of the year achievement levels.

Individual students third and fifth grade end of the year teacher-reported letter grades were obtained from students' cumulative records. These grades were recoded on a 5-point scale with a 5 representing the letter grade "A" and a 1 representing the letter grade "F".

Instructional book levels were obtained from students' records. An instructional book level is the publisher's

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[2] CAT scale scores are generated from a single, equal-interval scale of scores across all grades for use with all levels and forms of the test were used. These scores range from 000 through 999 and are useful for measuring growth of groups of students from year to year.

estimate of average amount of content to be covered in reading and math in a particular grade. Thus for grade 3, book level one indicates this book should be covered during the first half of third grade. Book level 3-2 is expected to be covered during the first half of third grade. Intermediate grades generally have 1 book level for each grade. However, on students' cumulative records, teachers also used this notation to indicate instructional placement in the intermediate grades. Theoretically, at the end of any grade, the instructional placement level should be the next grade. Thus at the end of grade 4, the instructional placement level should be Book 5.[3]

Group membership in Chapter I was dummy coded with a 1 representing participation and a 0 indicating non participants. School of attendance was also dummy coded with 1 representing School A and a 0 representing School B. The means and standard deviations of variables included in the study are presented in Tables 2 and 3.

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[3] A student's instructional placement level is generally obtained from a teacher-administered end-of-unit or end-of-book test embedded in a particular reading or math series. Specific information concerning the series used, criteria for mastery, and rationale for placement were not available.

1.3. Data Analysis

Data were analyzed initially to describe the distribution of each variable included in the analysis for each group. The relationship among variables between the groups were analyzed using an analysis of covariance model within a multiple regression framework, and an exploratory factor analysis.[4]

Two regression analyses were performed, one for math and one for reading. The reatment by covariate interaction which test the hypothesis of the homogeneity of the regression slopes was found to be non significant in both analyses. In each of the equations, fifth grade achievement was used as the criterion variable, and third grade achievement, instructional levels at third and fifth grade and letter grades at third and fifth grade and school were used as predictor variables. The order of entry of variables was predetermined by the researcher to reflect hypotheses expressed in the model.

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[4] The author is aware that the use of analysis of covariance to equate fundamentally dissimilar groups may result in a biased estimate of adjusted posttest differences if the groups are representative of distinct populations. Thus, any conclusions reached based on this analysis must be interpreted with caution.

The hypothesis test procedure consisted of 1) the overall test for goodness of fit of the regression equation, and 2) the test for specific regression coefficients using a hierarchical decomposition method.[5]

2. Results

First, descriptive statistics are presented for the two samples. Second, the results of the multiple regression analyses are presented.

2.1. Reading

2.1.1. Reading Achievement

An examination of the frequency distribution of Normal Curve Equivalents (NCEs) in reading achievement at third grade indicated that 10% of the Chapter I students compared to 64% of the non Chapter I students obtained an NCE score at or above the national average. By fifth grade, 22% of the Chapter I students compared to 76% of the non Chapter I students attained a score at this level. In third grade, 32% of Chapter I students compared to 4% of non Chapter I

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[5] The hierarchical method involves adjustments for only those variables that precede a given variable in the hierarchical order and thus reflects the total influence of each variable.

students attained a NCE score 1 standard deviation below the national average (s.d=21.06). By fifth grade, 16% of the Chapter I students compared to [illegible]% of the non Chapter I students attained a score at this level. These results are shown in Figure 2.

(Insert Figure 2 about here)

2.1.2. Instructional Levels

In third grade, 8% of the Chapter I students compared to 60% of the non Chapter I students were on grade level according to the end of year instructional placement levels. By fifth grade, 8% of the Chapter I students compared to 52% of the non Chapter I students were on grade level. At third grade, 40% of Chapter I students compared to 16% of non Chapter I students were 1/2 year below grade level. By fifth grade only 12% of the Chapter I students compared to 22% of non Chapter I students were at this level. In fifth grade, the majority of Chapter I students were 1 1/2 - 2 years below grade level. These results are shown in Figure 3.

(Insert Figure 3 about here)

2.1.3. Teacher-reported Letter Grades in Reading

In third grade, 28% of Chapter I students compared to 56% of non Chapter I students received a letter grade of an "A" or "B". In fifth grade, 26% of Chapter I students compared to 60% of non Chapter I students obtained these letter grades. The majority of Chapter I students received the letter grade of "C" in both third and fifth grade (64% in third and 58% in fifth.) These results are shown in Figure 4.

(Insert Figure 4 about here)

2.1.4. Relationship between Variables

The relationship between the variables for the two groups were examined using multiple regression. Fifth grade reading achievement scale score was used as the criterion variable. Third grade reading achievement scale score was used as a covariate, and third grade instructional level, third grade letter grade in reading, fifth grade instructional level, fifth grade letter grade in reading, group membership and school were used as predictor variables. The overall accuracy of the regression equation was reflected by a Mult R of .85 ($F=35.12$, 7 and 92 d.f., $P < .0001$). The standard error of the estimate was 32.8. Thus on the average

predicted fifth grade achievement will deviate from the actual scores by 32.8 scale score points.

The hierarchical test for the beta weights involved adjustments for only those variables that preceeded given variables in the hierarchical order, and therefore reflected the total influence of each variable. Thus, since third grade reading achievement as a covariate was entered first, it was tested without adjusting for other variables in the equation. Fifty nine percent (59%) of the variance could be attributed to third grade achievement ($F=202.10$, 1 and 92 d.f., $p<.0001$). This amount included not only that due to the direct effect of this variable but also that portion due to its indirect influence through third grade reading level, letter grades and other variables in the equation.

After adjusting for third grade achievement, group membership accounted for 3% of the variance in fifth grade achievement ($F=10.145$, 1 and 92 d.f., $p<.001$). After adjusting for third grade achievement and group membership, instructional level at third grade accounted for 2% of the variance ($F=8.273$, 1 and 92 d.f., $p<.05$). After adjusting for these variables, letter grade in reading accounted for 4% of the variance ($F=12.115$, $P<.001$). After adjusting for the

third grade variables and group membership, fifth grade instructional level accounted for 2% of these variance ($F=5.985$, 1 and 92 d.f., $P<.05$). After adjusting for all of these variables, school attended accounted for 2% of the variance in fifth grade achievement ($F=5.836$, 1 and 92 d.f., $p<.05$).

An examination of the standardized regression weights indicated the relative independent contribution of each variable. Other things being equal, one standard deviation unit change in third grade achievement would introduce the greatest change in fifth grade achievement and one unit change in reading grade at third or fifth grade the least.

Other things being equal, group membership had a negative effect on fifth grade achievement. The B weight of -14.92 for group membership indicated the Y- axis distance between the two regression lines and is the adjusted fifth grade achievement difference. A summary of the multiple regression results is shown in Table 4 and the zero-order correlation coefficients are presented in Table 5.

(Insert Tables 4 and 5 about here)

A principal components analysis was conducted to transform the set of six reading variables into a new set of composite variables that are orthogonal to each other.[6] Three principal components were extracted. Third grade reading instructional level accounted for 49.3% of the total variance in the all of the variables (=3.947). Fifth grade reading instructional level accounted for 15.1% (=1.20684) and third grade reading achievement accounted for 12.5% (=1.00) of the total variance in the data set.

2.1.5. Teacher-reported Letter grades

Letter grade in reading was regressed on groupmembership, instructional level and achievement for third and fifth grade, respsectively. In each analysis, only 15% of the variance in a particular grade could be accounted for by group membership, instructional level and reading achievement at that particular grade.

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[6] Transforming a set of variables into a set of factors may reveal relationships which are more difficult to discern among variables in their original form.

2.2. Math

2.2.1. Math Achievement

At third grade, 16% of the Chapter I students compared to 70% of the non Chapter I students obtained an NCE score at or above the national average. By fifth grade, 36% of the Chapter I students compared to 74% of the non Chapter I students attained a score at this level. Also, in third grade, 24% of Chapter I students compared to 4% of non Chapter I students obtained an NCE score 1 standard deviation below the national average. By fifth grade, only 8% of Chapter I students compared to 10% of non Chapter I students attained a score at this level. These results are shown in Figure 5.

(Insert Figure 5 about here)

2.2.2. Math Instructional Levels

At third grade, 44% of Chapter I compared to 82% of non Chapter I students were on grade level. By fifth grade, only 26% of Chapter I students compared to 66% of non Chapter I students were on grade level. In third grade, another 44% of Chapter I students were 1/2 year below grade level. By fifth grade, only 20% were at this level and the remainder were one or more years below grade level. These results are shown in

Figure 6.

(Insert Figure 6 about here)

2.2.3. Teacher-reported Letter Grades in Math

In third grade, 32% of Chapter I students compared to 58% of non Chapter I students received a letter grade of an "A" or "B". In fifth grade, 26% of Chapter I students compared to 54% of non Chapter I students obtained these letter grades in math. The majority of Chapter I students received a C in third grade and a D in fifth grade. These results are shown in Figure 7.

Insert Figure 7 about here

2.3. Relationship Between Variables

The relationship between the variable for the two groups was examined using multiple regression. Fifth grade math achievement scale score was the criterion and third grade math achievement scale score was used as a covariate, third grade letter grade and instructional level, fifth grade letter grade and instructional level, group membership and school attended were used as predictor variables. The overall accuracy of the regression equation was reflected by

a Multiple R of .76, (F=17.82, 7 and 92 d.f., p<.0001). The standard error of the estimate was 32.8. Thus on the average, predicted fifth grade achievement will deviate from the actual scores by 32.8 scale score units.

The hierarchical test for the betas indicated that third grade math scale score when entered first in the equation accounted for 50% of the variance in fifth grade math achievement (F=107.703, 1 and 92 d.f., p<.0001). After adjusting for the covariate, group membership accounted for .002% of the variance and was not significant. Third grade math level accounted for .0009% and was non significant.

After controlling for third grade achievement, group membership and instructional level, third grade math letter grade accounted for 1% of the variance and was marginally significant (F=3.895, 1 and 92 d.f., p <.06). After controlling for third grade variables and group membership, fifth grade math instructional level accounted for 2% of the variance (F=5.345, 1 and 92 d.f., p<.05), fifth grade math letter grade accounted for 3% (F=6.449, 1 and 92, p <.05) and school attended accounted for .003% and was not significant.

An examination of the standardized regression weights

indicated that other things being equal, one standard deviation unit change in third grade math achievement would introduce the greatest change in fifth grade achievement and one unit change in math grade at third grade the least. After controlling for third grade achievement, group membership had a positive effect, but was non significant. The B weight 10.3 indicated the Y-axis distance between the two regression lines and is the adjusted fifth grade achievement difference. A summary of the multiple regression results is shown in Table 6 and the zero-order correlation coefficients are presented in Table 7.

(Insert Tables 6 and 7 about here)

A principal components analysis was used to transform the six math variables into a new set of composite variables that were orthogonal to each other. Two principal components were extracted. Third grade math instructional level accounted for 44.1% (=3.5319) and fifth grade math instructional level accounted for 13.9% (=1.113) of the total variance in the data set.

2.3.1. Teacher-reported letter grades

The variable letter grade in math was regressed on group membership, instructional level, and achievement for third and fifth grade, respsectively. In the analysis of third grade variables, Mult R. = .56 ($F=14.82742$, 3 and 96 d.f., $p<.0001$) and indicated that roughly 30% of the variance in math grades could be accounted for by variables in the equation. Similar results were obtained in the analysis of the fifth grade variables.

3. Discussion

There was a high degree of intercorrelations among the variables used in this analysis, thus, one must be cautious in the substantive interpretation and importance attached to the regression coefficients. Coefficients obtained in highly correlated data sets are often characterized by instability and may fluctuate markedly from sample to sample (Kerlinger & Pedzahur, 1973; Darlington, 1968). In addition, in each of the regression analysis, any variable entered after the covariate contributed fairly small amounts to overall explanation.

3.1. Reading

The results of the multiple regression analysis indicated that 72% of the variance in fifth grade reading achievement could be explained by the variables in the regression equation. After adjusting for third grade achievement, participation in Chapter I for a two-year period appeared to have had a negative effect on fifth grade achievement. Part of this effect might be due to the indirect effect of participation in Chapter I on third grade reading instructional level, letter grade in reading and other variables in the equation. Third grade letter grade had a small but significant effect on fifth grade achievement even after controlling for instructional level, achievement and group membership. Alternatively, the "negative" effect may be artifactual and due to the type of analysis used. See Campbell and Erlebacher (1970) for a discussion of cautions in drawing conclusions from results of regression analyses.

After adjusting for third grade variables, instructional level in reading at fifth grade contributed a small but significant amount to explaining variance in fifth grade achievement. After all the variables were entered, the school variable contributed negatively to the prediction of fifth grade achievement. This suggest that attendance at

School A had a negative effect on students' fifth grade achievement above the negative influence attributed to participation in Chapter I for a two year period.

In this analysis, both school and chapter I participation were dummy coded. These codes are proxy variables and represent such characteristics related to student achievement as as engaged time, curricular emphases, coordination of programs, instructional leadership and high expectations. Such variables have been found to be related to differences in achievement between schools. The negative school effect might also represent a difference in School A's teachers' practices in the placement of Chapter I students in math and reading instruction.

The exploratory factor analysis provided an additional perspective on the relationships between the variables. The three principal components extracted in the reading variable data set were third grade instructional level, fifth grade instructional level and third grade achievement. One might speculate that the low instructional placement levels might partially explain the low achievement of Chapter I students. The descriptive data indicated that over the two year period of participation in Chapter I, the majority of these students

declined from being placed 1/2 year below grade level to 1 1/2 to 2 years below grade level. These results suggest the importance of instructional level placements as a potential indicator of content coverage. This variable might ultimately account for or partially explain the effect of participation in Chapter I. Teacher-reported grades in reading however, did not appear to reflect either students' instructional level or achievement. the level and growth of students' achievement.

3.2. Math

The results of the multiple regression analysis indicated that 58% of the variance in fifth grade math achievement could be explained by the variables in the regression equation. After adjusting for third grade math achievement, group membership in Chapter I had a positive but non significant effect on fifth grade achievement. The zero order correlation for group membership was negative; however, after controlling for third grade achievement differences between the groups, the beta weight was positive. This suggests that participation in Chapter I math lab over a two year period appeared to have had a slight positive effect.

Math letter grade at third grade had a slight but statistically significant influence on achievement as did

math letter grade at fifth grade. This suggests that after controlling for third grade achievement and participation in Chapter I, teacher-reported math grades at third and fifth grade had a positive effect on students' fifth grade achievement.

In the regression analysis, instructional level at third grade was not statistically significant. However, instructional level at fifth grade was significant. In the exploratory factor analysis, the two extracted principal components were third grade and fifth grade instructional level. These variables may partially explain the low achievement levels of Chapter I students. The descriptive data indicated that at third grade, the majority of Chapter I students were 1/2 grade level below in math. By fifth grade, the majority of these students were 1 or more years below grade level. Instructional level placement in math may serve as a potential indicator of content covered in math and influence subsequent student achievement.

Teacher-reported letter grades in math were reflective of student's instructional levels and achievement.

4. Conclusions

This study should be replicated with a larger sample and should include a controlled comparison group of students more similar to Chapter I students in terms of initial achievement. Other methodological improvements might include a more precise definition of Chapter I participation. For example, rather than using dummy codes to reflect participation, this variable might be expressed in terms of hours of exposure, time on task, and material covered Similarly, additional information on the school might be included to reflect such variables as teachers' expectation, degree of content covered with Chapter I students, and degree of coordination between Chapter I and regular teachers. Specific information should also be collected on teachers' decisions and rationale for instructional placement of Chapter I students as well as methods, procedures and criteria for determining placement.

Results of this pilot study suggest that instructional placement levels collected over time, in addition to analyses of standardized achievement gains in math and reading might provide more realistic estimates of program impact. The below grade level instructional placement levels of many Chapter I students may partially explain the negative effect

found in some longitudinal studies of Chapter I program impact.

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TABLE I

RACE AND SEX OF SAMPLE POPULATIONS

	RACE			SEX	
	Black	Hispanic	White	Male	Female
CHAPTER I	56.0%	2.0%	42.0%	54.0%	46.0%
Non-CHAPTER I	30.0%	---	70.0%	62.0%	38.0%

TABLE 2

MEANS AND STANDARD DEVIATIONS

READING VARIABLES

	Achievement Scale Scores				Instructional Placement Levels				Teacher-Letter Grade			
	3d		5th		3d		5th		3d		5th	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CHAPTER I (N=50)	369	37	436	43	2.5	.6	3.8	.8	3.2	.7	3.1	.8
NON-CHAPTER I (N=50)	420	47	503	58	3.1	.7	4.9	.9	3.7	.8	3.7	.8

TABLE 3

MEANS AND STANDARD DEVIATIONS

MATH VARIABLES

	Achievement Scale Scores				Instructional Placement Levels				Teacher-Letter Grade			
	3d		5th		3d		5th		3d		5th	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CHAPTER I (N=50)	373	26	457	31	3.0	.3	4.6	.6	3.1	.9	2.8	1.0
NON-CHAPTER I (N=50)	410	31	490	56	3.1	.1	5.0	.5	3.6	.8	3.6	.9

F I G U R E I

HYPOTHESIZED RELATIONSHIPS BETWEEN VARIABLES
INCLUDED IN THE STUDY

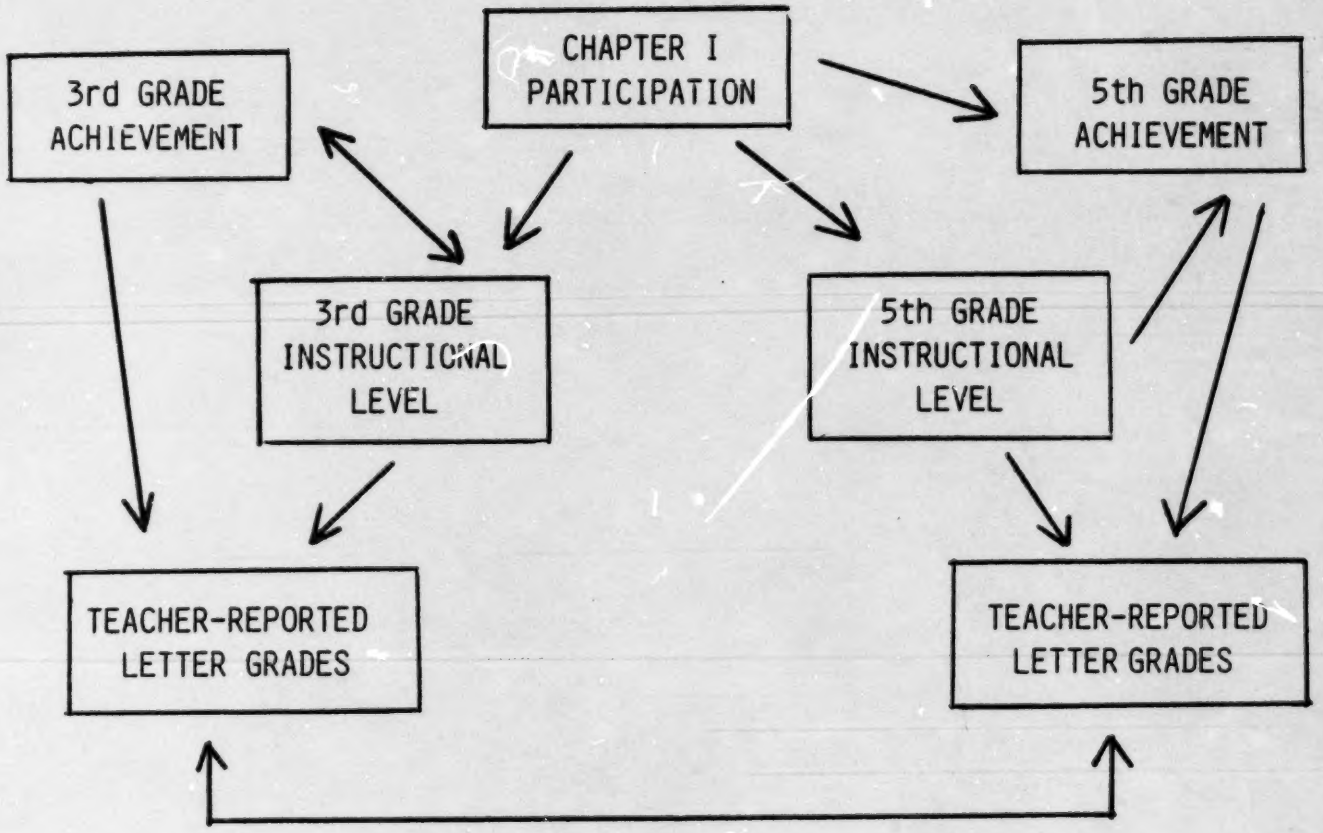
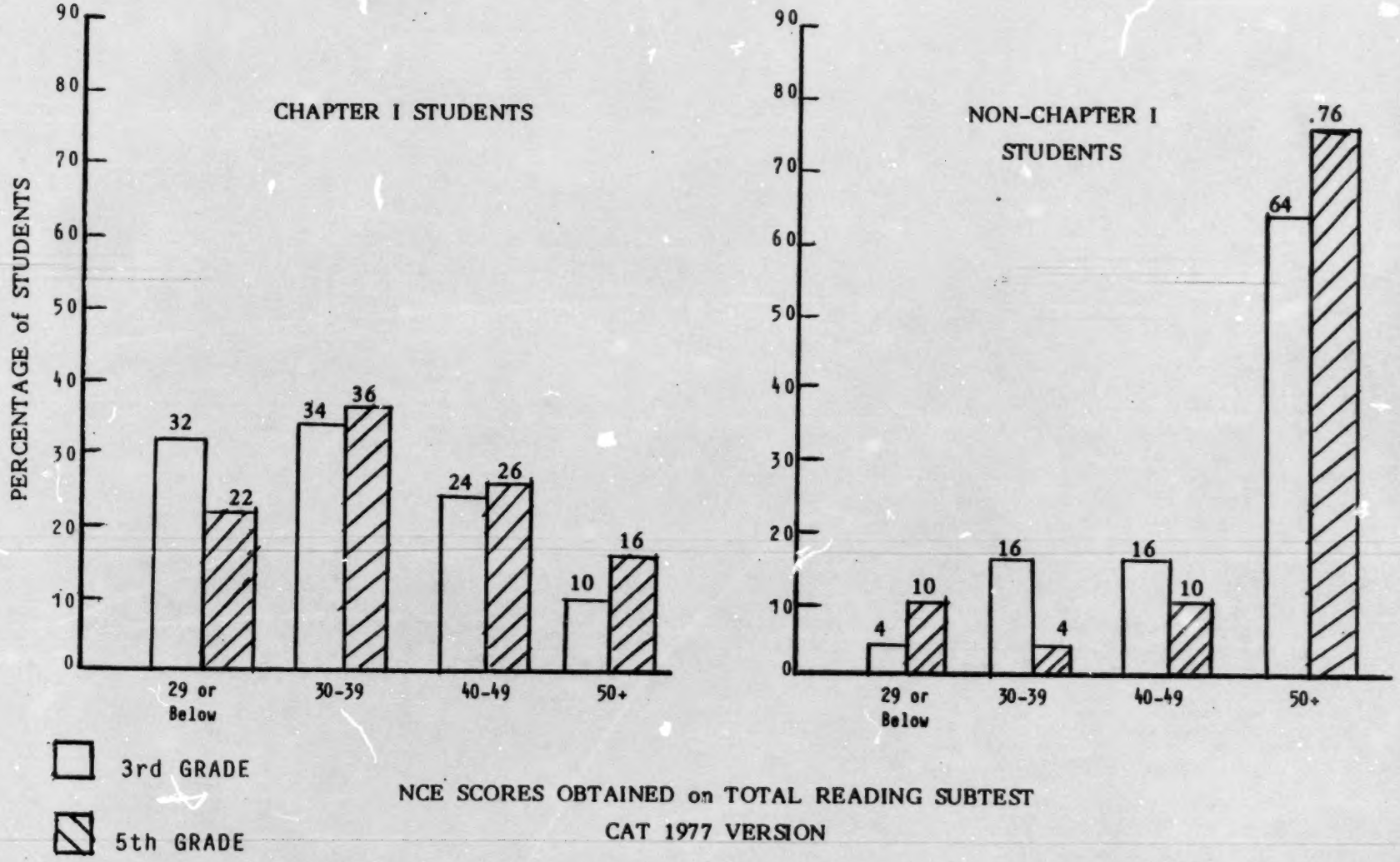
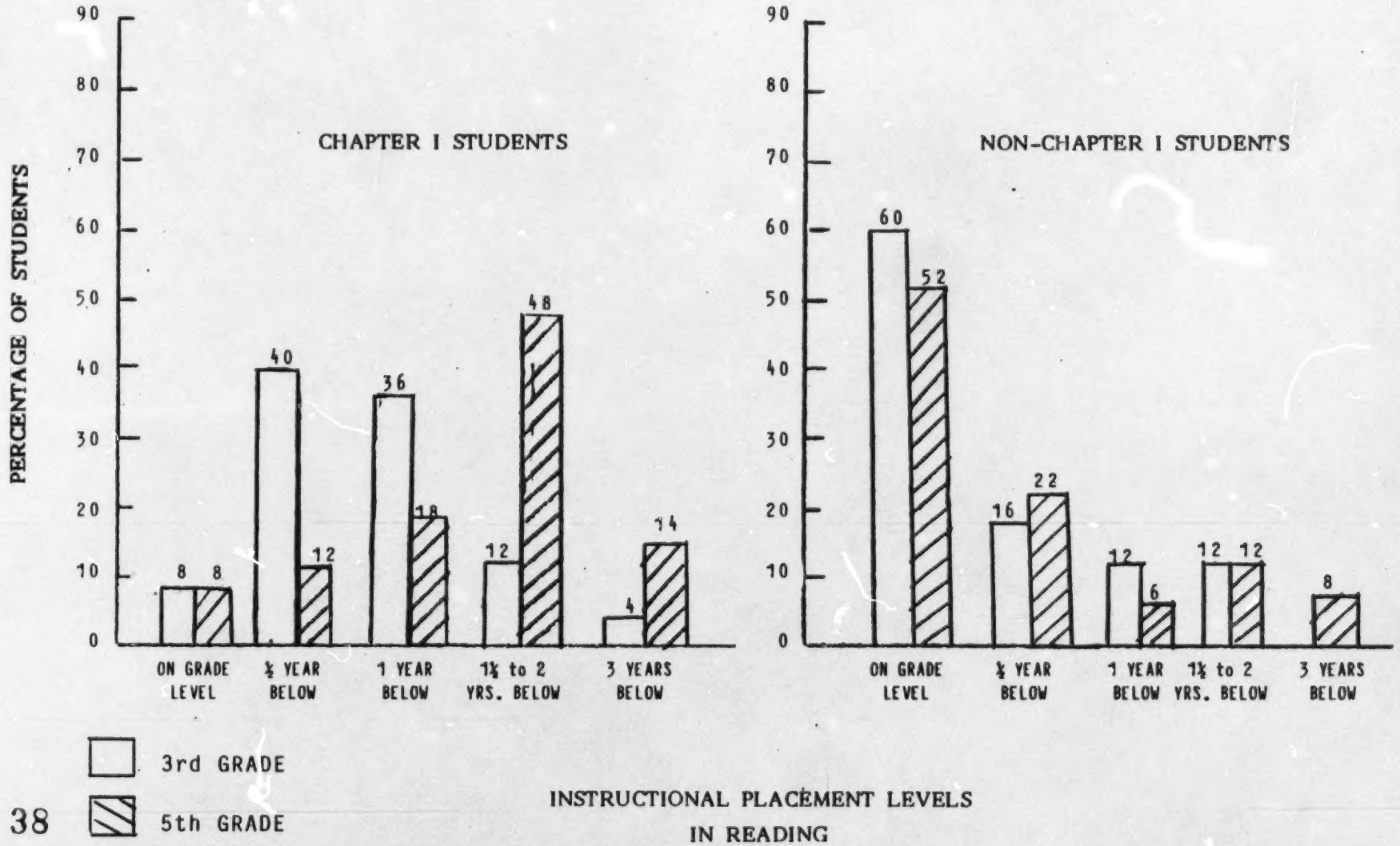


FIGURE 2



NCE SCORES OBTAINED on TOTAL READING SUBTEST
CAT 1977 VERSION

FIGURE 3



INSTRUCTIONAL PLACEMENT LEVELS
IN READING

FIGURE 4

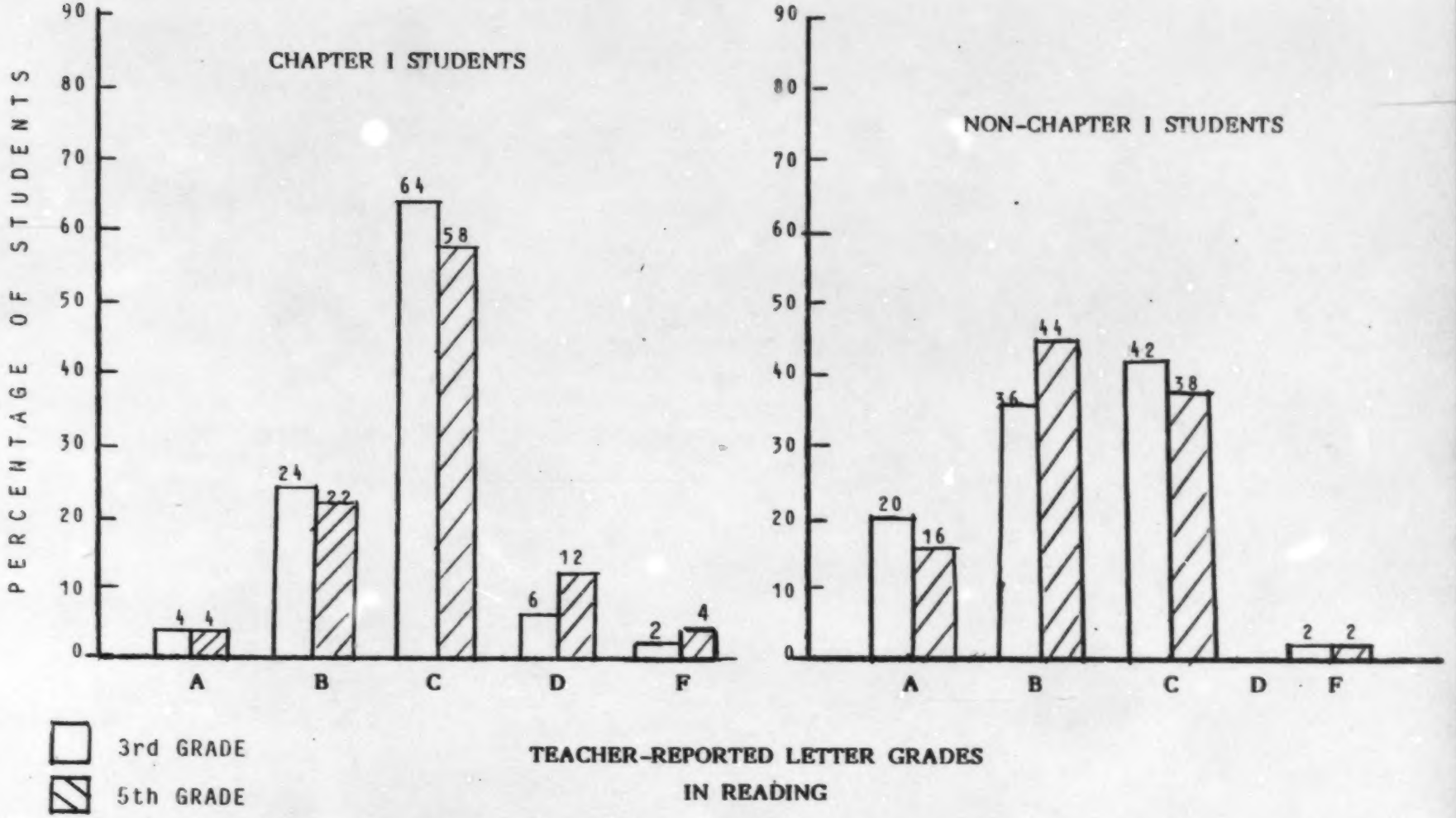

CHAPTER I STUDENTS
NON-CHAPTER I STUDENTS
PERCENTAGE OF STUDENTS
90
80
70
60
50
40
30
20
10
0
4 4
24 22
64 58
6 12
2 4
20 16
36 44
42 38
2 2
A
B
C
D
F
3rd GRADE
5th GRADE
TEACHER-REPORTED LETTER GRADES
IN READING

TABLE 4

SUMMARY of MULTIPLE REGRESSION RESULTS - READING

VARIABLE *	B	SE B	BETA	CORREL.	PART. CORR.	PARTIAL	R SQUARE CHANGE	F	SIG. F
3rd Gr. Achievement	0.52786	0.10717	0.42866	0.77332	0.26797	0.45682	.59802	202.10	.0001
Group Membership	-14.92800	8.44305	-0.12371	-0.55044	-0.09619	-0.18128	.03002	10.145	.001
3rd Grade Inst. Lvl.	8.22197	7.63318	0.09239	0.65525	0.05860	0.11160	.02448	8.273	.005
3rd Gr. Letter Grade	6.62378	4.98029	.08980	0.48930	0.07235	0.13735	.03585	12.115	.001
5th Gr. Inst. Lvl.	14.13328	5.58352	0.24273	0.74251	0.13770	0.25517	.01771	5.985	.05
5th Gr. Letter Grade	6.13734	4.22182	0.08762	0.30548	0.07908	0.14985	.00437	1.476	---
School Attended	-17.30145	7.16263	-0.14048	-0.11862	-0.13141	-0.24421	.01727	5.836	.05
(Constant)	150.48559	37.77928							

* Variables are listed in the order of entry into the regression equation.

Multiple R =.85 F = 35.12, 7 and 92 d.f., p<.0001

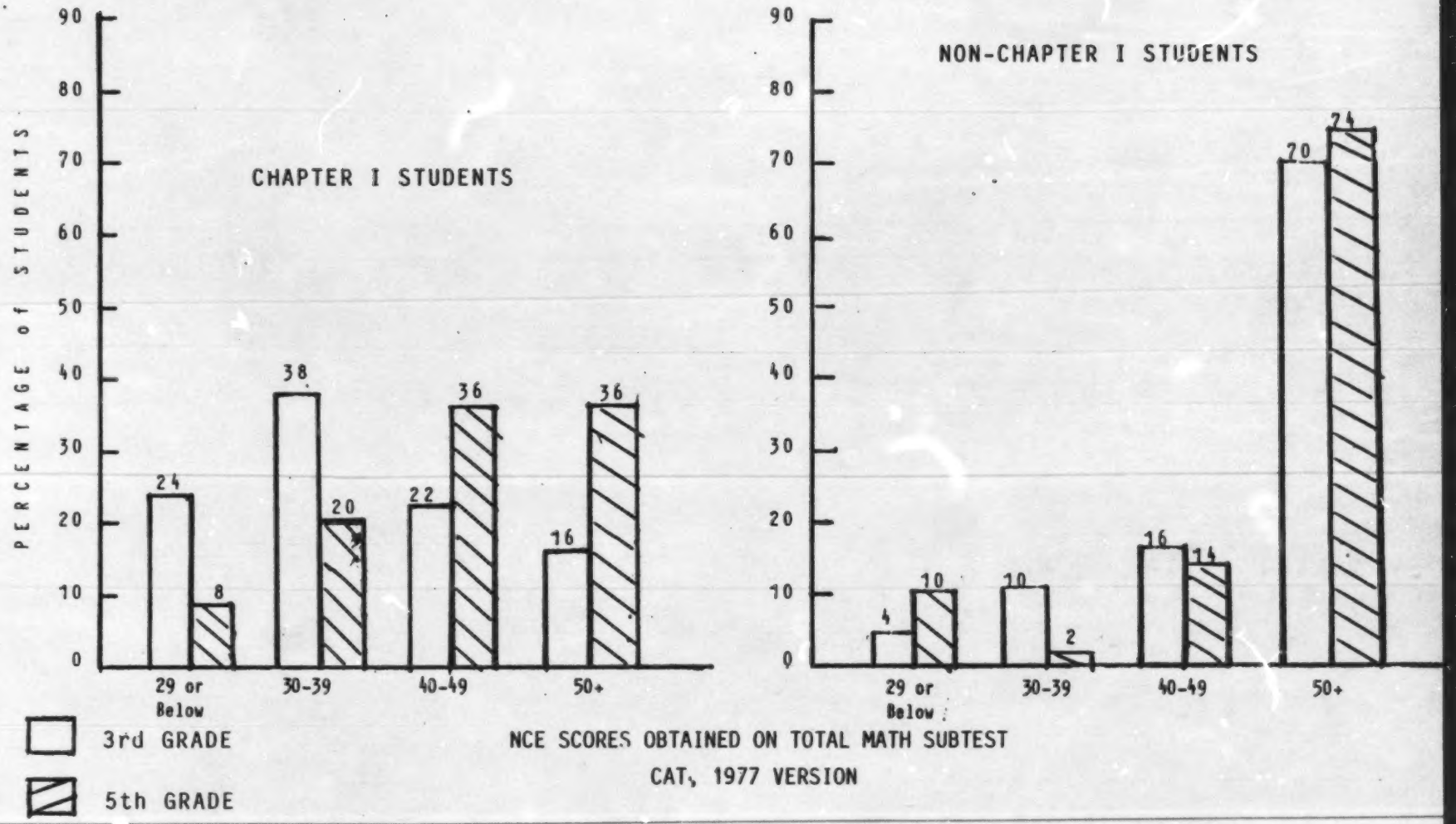
TABLE 5

CORRELATIONS and SIGNIFICANCE LEVELS for READING ACHIEVEMENT, INSTRUCTIONAL LEVEL, GRADES, and GROUP MEMBERSHIP

	5th Grade Achievement Scale Score	3rd Grade Achievement Scale Score	3rd Grade Instructional Level	5th Grade Instructional Level	3rd Grade Letter Grade	5th Grade Letter Grade	Group Membership	School Attended
5th Grade Achievement	1.000							
3rd Grade Achievement	0.773*	1.000						
3rd Grade Inst. Lvl.	0.655*	0.699*	1.000					
5th Grade Inst. Lvl.	0.743*	0.710*	0.721*	1.000				
3rd Grade Letter Grade	0.489*	0.350*	0.338*	0.495*	1.000			
5th Grade Letter Grade	0.305*	0.229*	0.182*	0.183*	0.280*	1.000		
Group Membership	-0.550*	-0.520*	-0.378*	-0.523*	-0.306*	-0.360*	1.000	
School Attended	-0.119	0.059	0.035	-0.024	-0.255*	0.081	-0.122	1.000

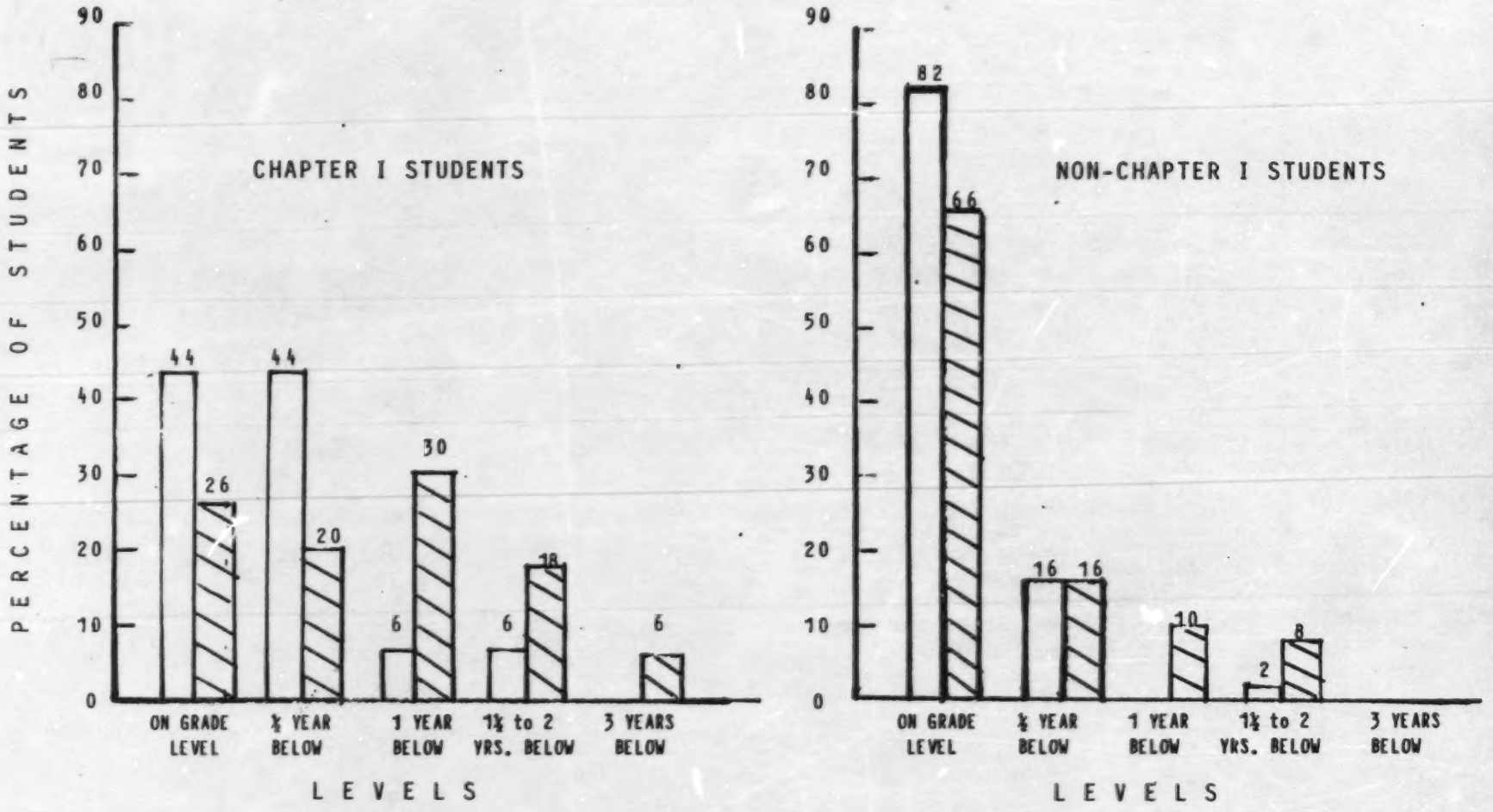
* Significant at $p < .01$ or less

FIGURE 5



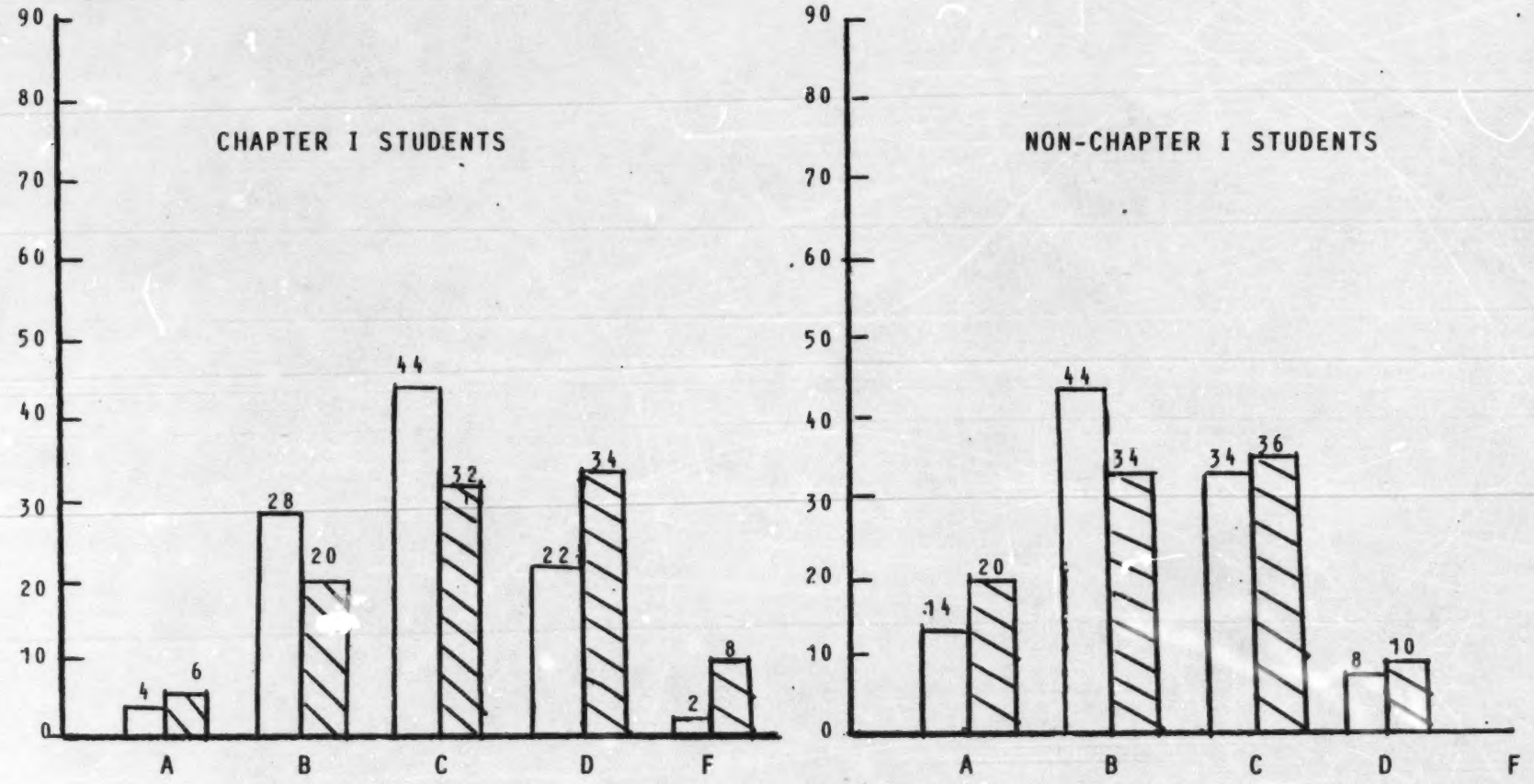
NCE SCORES OBTAINED ON TOTAL MATH SUBTEST
CAT, 1977 VERSION

FIGURE 6



INSTRUCTIONAL PLACEMENT LEVELS IN MATHEMATICS

FIGURE 7



TEACHER-REPORTED LETTER GRADES
IN MATHEMATICS

3rd GRADE

5th GRADE

TABLE 6

SUMMARY of MULTIPLE REGRESSION RESULTS - MATHEMATICS

VARIABLE *	B	SE B	BETA	CORREL.	PART. CORR.	PARTIAL	R SQUARE CHANGE	F	SIG. F
3rd Gr. Achievement	0.79734	0.14563	0.56090	0.70489	0.37188	0.49575	.49687	107.708	.0001
Group Membership	10.38565	8.25920	0.10743	-0.34941	0.08541	0.12999	.00209	.453	---
3rd Grade Inst. Lvl.	-8.86335	13.79562	-0.04990	0.25621	-0.04304	-0.06683	.00094	.203	---
3rd Gr. Letter Grade	4.87937	4.70407	0.08875	0.50779	0.07045	0.10752	.01797	3.895	.06
5th Gr. Inst. Lvl.	14.21320	7.54904	0.17175	0.54287	0.12788	0.19262	.02466	5.345	.05
5th Gr. Letter Grade	8.87966	3.58066	0.19416	0.44658	0.16844	0.25032	.02975	6.449	.05
School Attended	-5.90517	6.99944	-0.05985	-0.0921-	-0.05730	-0.08762	.00328	.711	---
(Constant)	73.92039	58.19496							

* Variables are listed in the order of entry into the regression equation.
Multiple R = .76 F = 17.82, 7 and 92 d.f., p<.0001

TABLE 7

CORRELATIONS and SIGNIFICANCE LEVELS for MATHEMATIC ACHIEVEMENT, INSTRUCTIONAL LEVEL, GRADES, and GROUP MEMBERSHIP

	5th Grade Achievement Scale Score	3rd Grade Achievement Scale Score	3rd Grade Instructional Level	5th Grade Instructional Level	3rd Grade Letter Grade	5th Grade Letter Grade	Group Membership	School Attended
5th Grade Achievement	1.000							
3rd Grade Achievement	0.705*	1.000						
3rd Grade Inst. Lvl.	0.256*	0.331*	1.000					
5th Grade Inst. Lvl.	0.543*	0.583*	0.466*	1.000				
3rd Grade Letter Grade	0.508*	0.561*	0.223*	0.394*	1.000			
5th Grade Letter Grade	0.447*	0.371*	0.246*	0.355*	0.371*	1.000		
Group Membership	-0.349*	-0.550*	-0.290*	-0.394*	-0.307*	- 0.388*	1.000	
School Attended	-0.092	0.039	-0.067	-0.100	-0.144	-0.073	-0.122	1.000

* Significant at $p < .01$ or less